Recognizing occupational and environmental hazards

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October 29, 2021

Faculty/Presenter Disclosure

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- **Faculty:** Victoria Arrandale, PhD, ROH

- **Relationships with financial sponsors:**
  - **Grants/Research Support:** Canadian Institutes of Health Research; Canadian Cancer Society; Ontario Ministry of Labour, Training and Skills Development; Workplace Safety and Insurance Board Ontario
  - **Speakers Bureau/Honoraria:** WorkSafeBC, University of Guelph, Ryerson University
  - **Consulting Fees:** None
  - **Patents**: None
  - **Other:** Employee at University of Toronto

Disclosure of Financial Support

- **This program has received financial support from the Workplace Safety and Insurance Board (WSIB) in the form of an educational grant.**
- **This program has received in-kind support from** – N/A

- **<u>Potential for conflict(s) of interest</u>:**
  - None

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- The information presented in this program is based on recent information that is explicitly ‘‘evidence-based’’.

- This Program and its material is peer reviewed and all the recommendations involving clinical medicine are based on evidence that is accepted within the profession; and all scientific research referred to, reported, or used in this CME/CPD activity in support or justification of patient care recommendations conforms to the generally accepted standards

Learning Objectives

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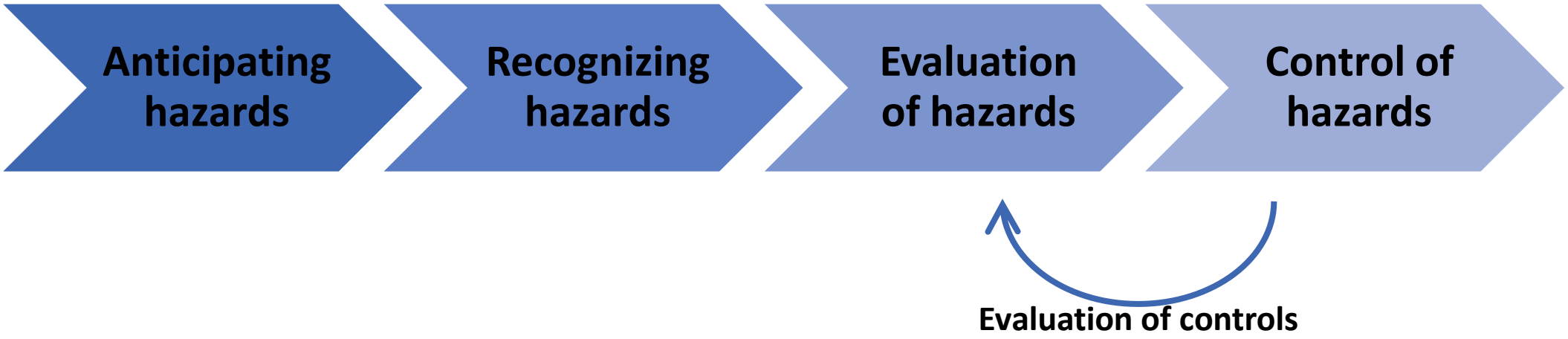
By the end of this session, participants will be able to:

- Describe the common types of occupational hazards
- Identify the occupational exposure limits that may apply to an individual worker
- Develop questions that will help to better understand a worker's occupational exposures

What is Occupational Hygiene?

"*the discipline of anticipating, recognizing, evaluating and controlling health hazards in the working environment with the objective of protecting worker health and well-being and safeguarding the community at large*" ~ Canadian Registration Board of Occupational Hygiene



Occupational Hygienists

- Usually have an undergraduate and graduate degree
- Two common North American professional designations: ROH, CIH
- Employed in a variety of settings
  - Industry, WSIB, Ministry of Labour, consulting, research, advocacy and clinical settings
- Most workplaces do not have a dedicated hygienist
- But many avenues for accessing occupational hygiene expertise:
  - Joint health and safety committee (or health and safety rep) in the workplace
    - Company hygienist, private consultants
  - Workers: Occupational Health Clinics for Ontario Workers
  - Employers: Health and safety associations as part of the Ontario Health and Safety System

Collaboration between Occupational Hygiene and Medicine

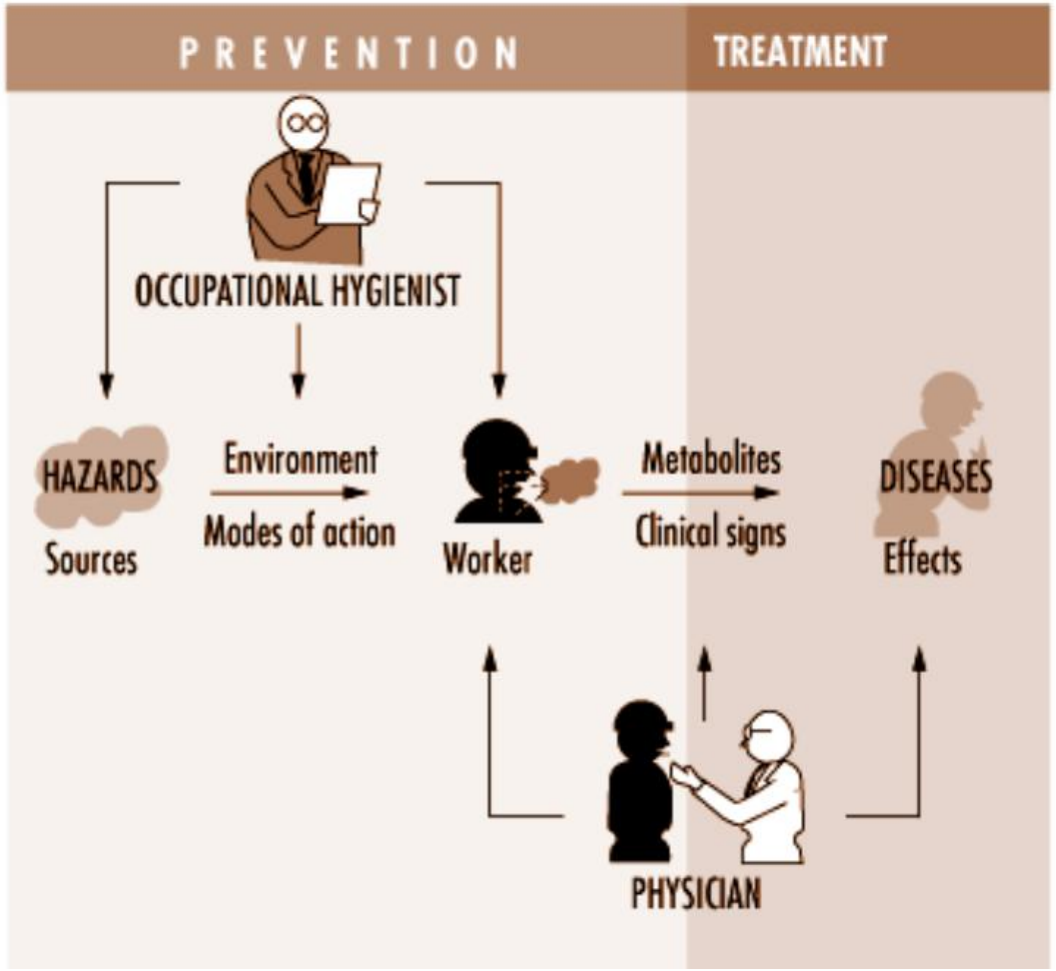


Image from: International Labour Organization (ILO)
ILO Encyclopedia, Chapter 30

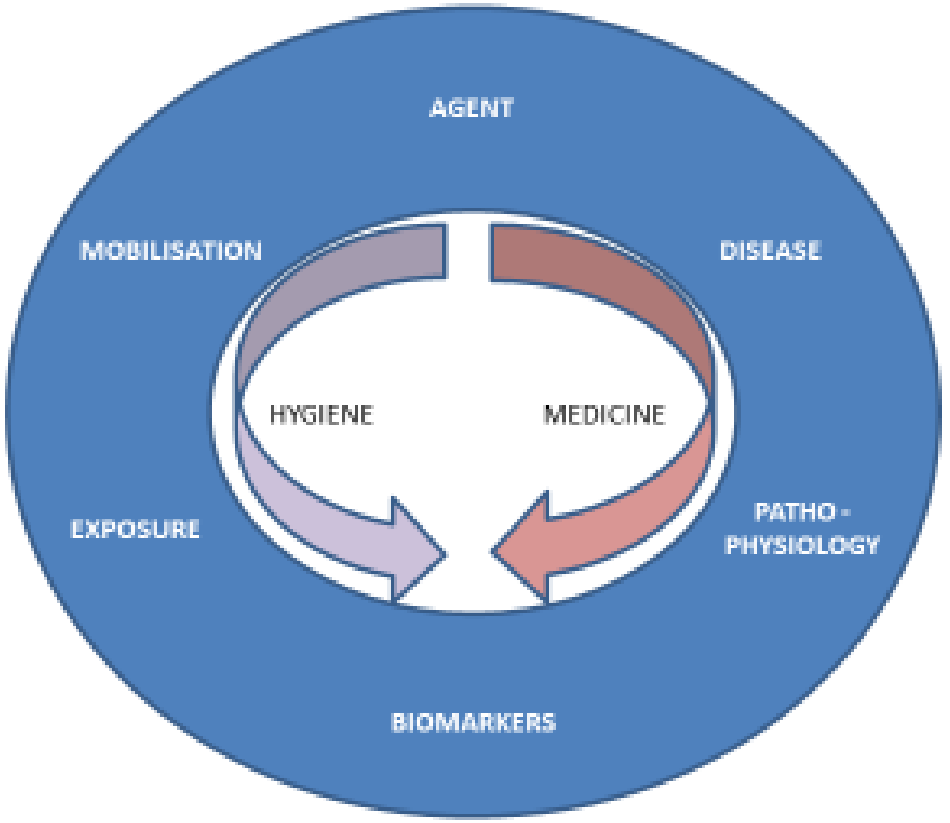


Image from: Dr. Anil Adisesh

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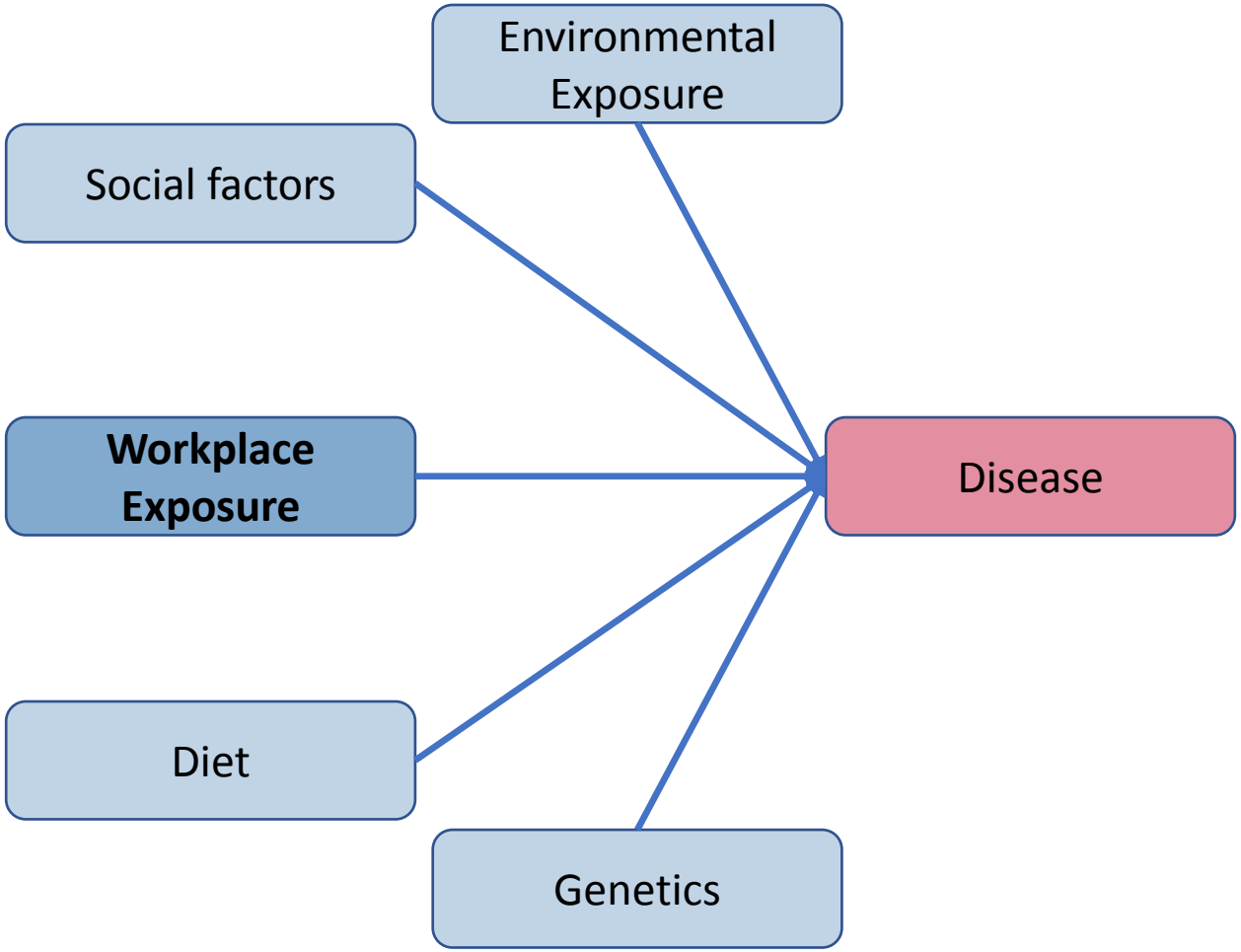
Challenge of Occupational Illnesses

Occupational illnesses are multifactorial

- *Some notable exceptions, including mesothelioma, pneumoconioses named for causal exposure*

Identifying causal exposure is difficult in many cases

Many clinicians did not receive training in occupational hygiene or exposure science



Common Occupational Diseases

When should a family physician think about possible workplace exposures?

- Asthma – new onset, exacerbations
- COPD
- Contact dermatitis – irritant and allergic forms
- Carpal tunnel syndrome
- Epicondylitis
- Noise*

J Bepko and K Mansalis Am Fam Physician. 2016 Jun 15;93(12):1000-1006.

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Why does identifying exposure matter?

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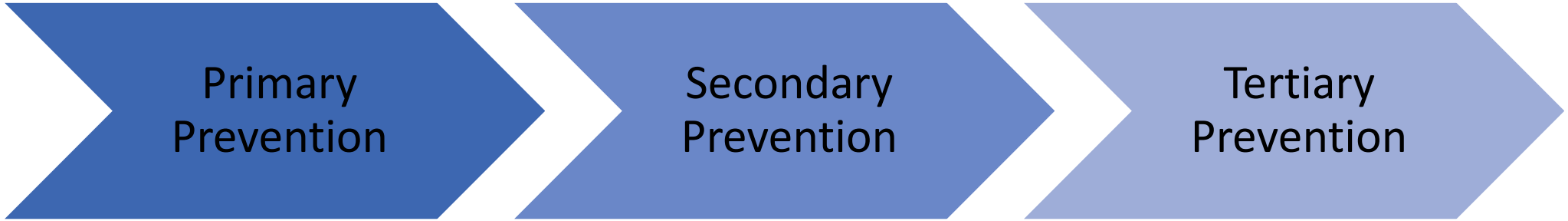
Support disease recognition (workers and clinicians)

Support prevention activities

- May impact compensation
- May impact return to work
- May help other exposed workers in similar jobs



- Reducing/avoiding exposure among healthy workers
- Identifying early stages of disease among workers with exposure
- Ensuring appropriate treatment and compensation for workers with disease

Hazard Categories, with examples

Recall didactic from Week 3 (Oct 1, Vince Spilchuk)

Chemical	•*Vapours, dusts, gases, fumes*
Biological	• *Influenza, COVID-19, mold and fungi, bacterial infections*
Physical	• *Noise, vibration, radiation*
Ergonomic	• *Awkward postures, repetitive motions, heavy lifting*
Psychological	• *Job demands, job control, interpersonal relations*

Routes of Exposure

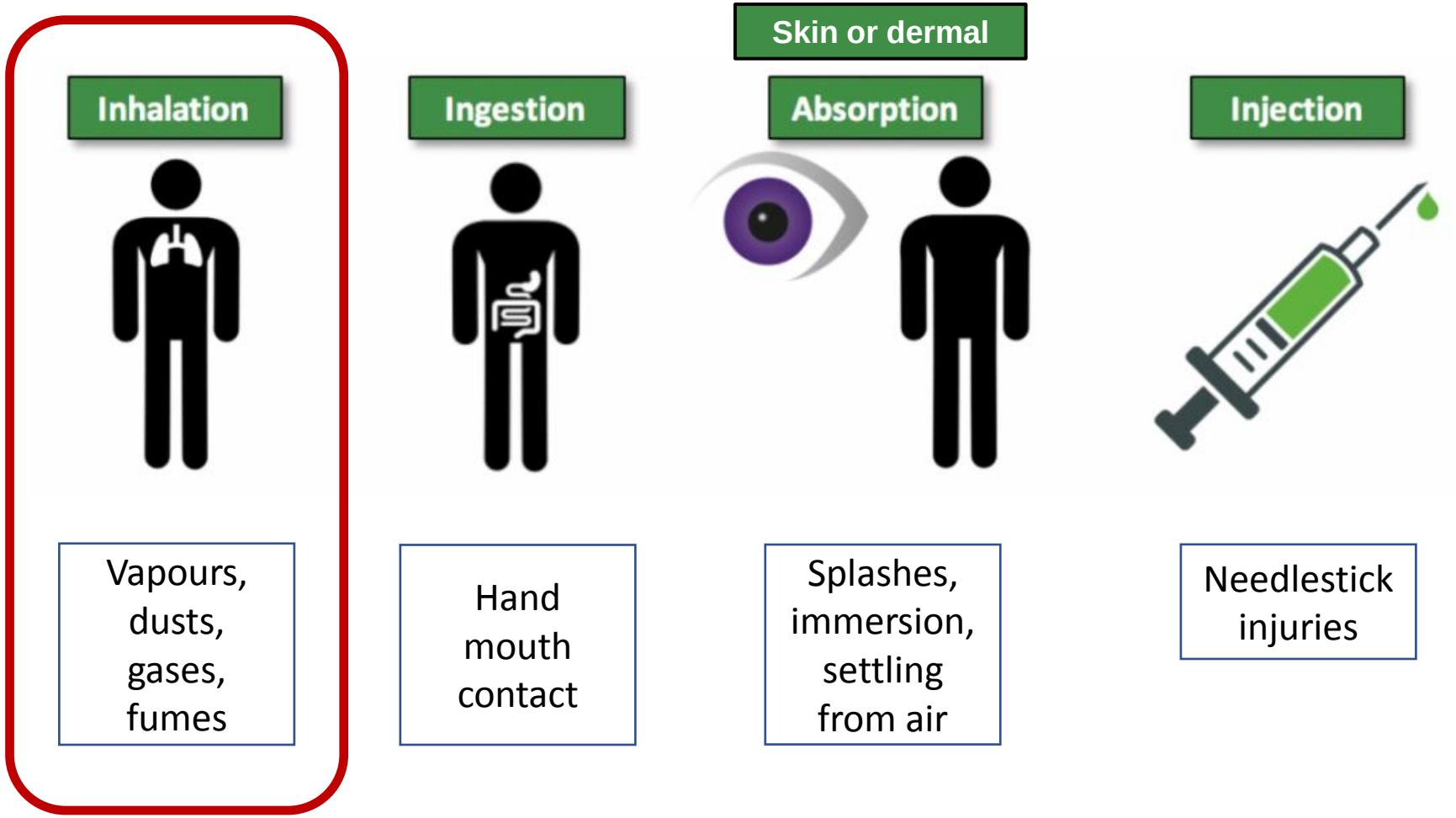


Image modified from: U of North Texas, https://riskmanagement.unt.edu/hcs-ghs-module2

Occupational Exposure Limits (OELs)

One tool for preventing exposure

Theoretically a level at which most workers can be exposed for a normal work week over an average working life without developing illness

But,

- Generally set with a particular outcome in mind, may not be protective for all health outcomes
- Can only be set when there is sufficient evidence (peer reviewed)
- Not regularly updated
- Not available for many (most?) exposures
- Consider exposures individually

For chemicals,

- *ACGIH >700 TLVs*
- *US EPA has >85,000 listed in TSCA*
- *Canada CMP identified 4300 priorities*

American Conference of Governmental Industrial Hygienists (ACGIH)

- Many bodies recommend or regulate exposures limits
- Canadian jurisdictions tend to lean on ACGIH
  - “Charitable scientific organization that advances occupational and environmental health”
- ACGIH recommendations:
  - an “expression of scientific opinion”
  - health-based limits, not consensus based
  - do not consider economic or technical feasibility

How are exposures regulated in Ontario?

- Federally regulated workers
  - Canada Labour Code
  - Adopts recommendations from the American Conference of Governmental Industrial Hygienists (ACGIH)
- Provincially regulated workers
  - Ontario Occupational Health and Safety Act
  - Use the American Conference of Governmental Industrial Hygiene (ACGIH) as a starting point
  - Periodic public consultation
  - Adoption of ACGIH limits is not automatic

Examples of federally regulated sectors:

- Air transportation
- Road, marine and rail transportation that crosses provincial or international borders
- Banks
- Grain elevators
- First Nations band councils
- Most federal Crown corporations
- Radio and television broadcasting
- Telecommunications
- Uranium mining/processing
- Atomic energy

Exposure Limits Vary Across Provinces and Workplaces

Respirable crystalline silica (quartz)	
Canadian Jurisdictions	**OEL**
Canada Labour Code	0.025 mg/m^3
AB, BC, MB, NL, NS, PE	0.025 mg/m^3
NT, NU, SK	0.05 mg/m^3
NB, ON, QC	*0.1 mg/m^3*
Other Jurisdiction	**OEL**
ACGIH 2020 TLV	**0.025 mg/m^3**

Modified from CAREX Canada
https://www.carexcanada.ca/profile/silica_crystalline/

Links to provincial regulations are available on the Canadian Centre for Occupational Health and Safety Info Web

No Occupational Exposure Limit?

- Not uncommon
- Many more chemicals in use than there are OELs
  - ACGIH >700 OELs
  - >85,000 chemicals listed in US Toxic Substances Control Act
  - Canada's Chemical Management Plan identified 4300 chemical priorities
- General Duty Clause in Occupational Health and Safety Act still applies
  - *"take every precaution reasonable in the circumstances for the protection of a worker"*
- Hygienists will look to scientific literature and look to other exposures
  - E.g., similar physical-chemical properties

Collecting an Occupational History

- Critical step in recognizing occupational illnesses
- What's in an occupational history?
  - Job title
  - Job tasks
  - Industry of employment
    - Welder in small auto shop vs. welder in pulp and paper mill
    - Nurse in operating room vs nurse in public health unit
  - History and progression of employment (long latency diseases)
  - Hobbies, second jobs, volunteer work

Collecting Additional Exposure Information

- Information on workplace process
  - What is done/made/produced? (and from what?)
- Review Safety Data Sheets (SDS)
  - Available from workplace, manufacturer and/or supplier (sometimes online)
  - Exemptions? Personal use, proprietary information
- Determine if controls are in place (including PPE)
  - But in place does not necessarily = effective
- Any Joint Health and Safety Committee involvement on the issue?
- Any co-workers with similar exposures or concerns?

Practical Tools

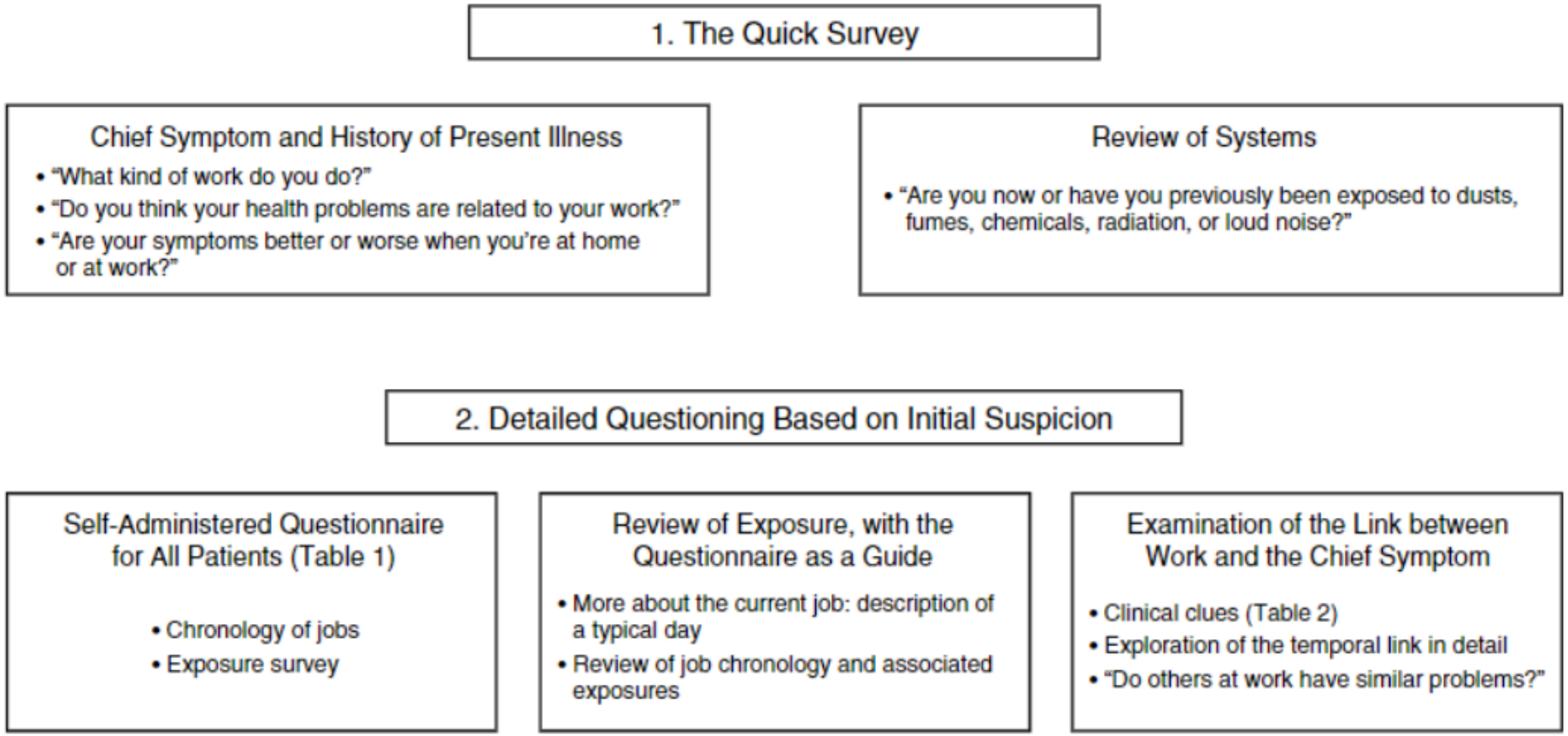


Figure 1. The Initial Clinical Approach to the Recognition of Illness Caused by Occupational Exposure.

Newman LS. Occupational illness. N Engl J Med 1995;333:1128-1134

WHACS Mnemonic

What do you do?

How do you do it?

Are you concerned about any exposures on or off the job?

Co-workers or others with similar symptoms?

Satisfied with your job?

Blue et al. J Occup Environ Med. 2000 Nov

Identifying Exposures

- Work with the worker
- Use common/generic terms initially
  - Vapours, dusts, gases, fumes, chemicals, radiation, loud noise
- Use product names, not chemical names
- Consider whether they can perceive the exposure
  - Noise
  - Dust – visible
  - Chemicals – odour thresholds vary

Additional Resources

More on taking an occupational history:

- Occupational Medicine Clinical Snippet August 2016: Taking an Occupational History

Information and worker supports in Ontario:

- Occupational Health Clinics for Ontario Workers

General OHS information:

- International Labour Organization Encyclopedia of Occupational Health and Safety
- Canadian Centre for Occupational Safety and Health (CCOHS)
- US National Institute for Occupational Safety and Health (NIOSH)
- UK Health and Safety Executive (HSE)

Thank you

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